

REMARKS/ARGUMENTS

The applicant's attorneys appreciate the Examiner's thorough search and remarks.

Claims 1-9 were rejected as obvious over Kurz (4,395,673) or alternatively over the Applicant Admitted Prior Art (AAPA) each taken with Beihoff et al. (Beihoff). Reconsideration is requested.

Claim 1 has been amended and now calls for the following combination:

1. An integrated active rectifier module comprising;

a base plate;

a plurality of substrates attached to one surface of said base plate each with a respective flexible adhesive; a heatsink in thermal contact with said base plate and positioned opposite said substrates;

power elements for an active rectifier for supplying recharging power to a battery of an automobile, said active rectifier being mounted on one substrate, and including a plurality of active rectification circuits each connectable to a respective phase of a stator to rectify the power output thereof;

elements for a voltage regulator to regulate the output voltage of said stator, said voltage regulator being mounted on another substrate; and

elements for driving said power elements mounted on another substrate.

Neither Kurz nor AAPA teaches or suggests a module arrangement. Rather, each shows an electronic circuit diagram.

Beihoff fails to show "a plurality of substrates attached to one surface of said base plate each with a respective flexible adhesive; a heatsink in thermal contact with said base plate and positioned opposite said substrates".

Rather, Fig. 2 of Beihoff shows substrates and components on both side of a "thermal support 12":

[0053] Fig. 2 illustrates an exemplary alternative configuration of a power module 10 in which components are mounted on both sides of the thermal support. In the embodiment of Fig. 2, power electronic circuit 14 is again mounted to side 26 of the thermal support 12. In the embodiment of Fig. 2, however, driver circuitry

34 for controlling functioning of the power electronic circuit is mounted to the same side 26 of the thermal support, while control circuitry 36 is separated from the driver circuitry. Energy storage and conditioning circuitry, as indicated generally at reference numeral 38, is also mounted on the thermal base. As before, interconnections 32 between driver circuitry 34 and power electronic circuit 14 are provided, as are similar connections 40 between the control circuitry and the driver circuitry, and interconnections 42 between the power electronic circuit 14 and the energy storage and conditioning circuitry 38. As will be noted, in the embodiment of Fig. 2, the geometry, layout and space utilization of the thermal support are adapted such that the control circuitry 36 and the energy storage and conditioning circuitry 38 are mounted on a lower side 44 of the thermal support 12. All such components may therefore be mechanically and electronically supported on the thermal support, while receiving cooling via coolant flow as indicated by arrows 22 and 24. Paragraph [0053] Beihoff.

It has been alleged that Beihoff teaches a heatsink in thermal contact with the base plate. However, a close examination of Beihoff would reveal that the arrangement disclosed by Beihoff is distinguishable from claim 1.

First, it should be noted that thermal support 12 is fluid cooled. Thus, substrates are mounted on thermal support 12 in order to dissipate heat generated by devices thereon.

Fig. 15A, which has been alleged to show a heatsink 148, 160, shows an interface plate 148 on which “power electronic device subassemblies 130 are formed”. Paragraph [0074], lines 17-19. As described in paragraph [0074], interface plate 148 provides a path to thermal support 12 so that heat generated by power devices may be dissipated. Thus, as is clear the part that functions as the heatsink is thermal support 12 not the interface plate 148. On the other hand, a module according to the present invention calls for a heatsink, which is used for heat dissipation from the base plate.

Moreover, Fig. 15A does not specify whether plate 148 is opposite substrates that include power elements, elements for a voltage regulator, and elements for driving the power elements as called for by claim 1. Rather, plate 148 appears to be interposed between the power electronic device assemblies 130 and thermal support 12. Therefore, claim 1 is structurally distinguishable from Beihoff.

For the above reasons, it is respectfully suggested that the art of record does not render claim 1 obvious. Reconsideration is requested.


The application is believed to be in condition for allowance. Such action is earnestly solicited.

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